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Wage Statistics and the Federal Census.

In the United States, the Federal census presents the earliest official data concerning statistics of wages. The censuses of 1850 and 1860¹ made exactly the same inquiries upon this subject. In both cases the schedules² called for "the average number of hands employed", male and female, and the "average monthly cost" of male labor and of female.

It must be remembered that in these censuses, as well as in that of 1870, the enumeration was conducted by the United States marshals, who, upon their regular rounds, called upon manufacturers and gathered data. No prior schedules were used, and the marshals received only fifteen cents for each manufacturing establishment enumerated.³ Under the circumstances the work of collecting data relating to employees and wages could not be carefully and intelligently done, except in the rarest cases, while the enumerators failed to visit any establishments that it seemed convenient to omit. No great value, therefore, can be attached to statistical tables based upon such uncertain materials.

In explanation of the schedules employed, the enumerators in the seventh census were given the following instructions:⁴ "Under the general heading 'hands employed', is to be inserted the average number of each sex employed during the year in the manufacture or business. These numbers are to be es-

¹It is not necessary to refer to the questions asked in 1820 and 1840 concerning hands employed and total wages paid. For the schedules used in these censuses see Report on a Permanent Census Bureau, 140, 145, Senate Executive Documents, 1, 52d Congress, 1st Session.

²*Idem*, 148, 152. See also Seventh Census, xxiv.

³See remarks of General Walker, in Ninth Census, 3 : 391.

⁴Seventh Census, xxiv.

timated either by an average of the whole year, or by selecting a day when about an average number was employed, and inserting the number on such a day as the average." "Under heading 10 and 11, entitled 'Wages', is to be inserted the average monthly amount paid for all the labor of all the hands, male and female, employed in the business or manufacture during the course of the year. In all cases where the employer boards the hands, the usual charge of board is to be added to the wages; so that cost of labor is always to mean the amount paid, whether in money, or partly in money and partly in board; and the average number of hands and the average monthly wages are to be returned, so that by dividing the latter by the former the result will show the average earnings of individuals. This is also to include the individual labor of a producer, working on his own account, whose productions are separately enumerated."

If the enumerators attempted to follow these instructions, it is evident that the average number of employees reported must be in most cases a mere estimate, not a true average. In the next place, the directions given for a determination of average monthly wages were highly unfortunate. In most cases the total yearly wages can be easily and quickly ascertained. To attempt to estimate average monthly wages with a staff of untrained and underpaid enumerators must lead only to confusion. Remembering, finally, that most of the marshals did their part of the work as carelessly and hastily as possible, we can conclude only that the number of hands employed and the average monthly wages could not have been ascertained with even reasonable accuracy. The average yearly earnings deduced from such data must have been grossly inaccurate. The

study of subsequent censuses will serve to reinforce this conclusion concerning the wage statistics of 1850 and 1860.¹

In addition to the materials just described, the seventh and eighth censuses provided, in the schedules of social statistics, general questions concerning the average wages of farm hands, laborers, carpenters, and domestics.² In the eighth census the results were published.³ Of course the answers consisted mainly of conjectural averages, and can possess but slight value, at least for purposes of comparison. In 1870 these inquiries were wisely omitted.

In 1870 the questions asked in the census schedules of manufactures were greatly changed, and alterations were made in the form of inquiry concerning employees and wages. General Garfield's report had recommended that a sharp separation of firm members and hired laborers should be enforced, and that the schedules should call for the "Amount of wages paid during the year."⁴

The wisdom of both recommendations is too apparent to need any discussion. The schedules finally adopted⁵ called for the average number of hands employed, males above 16, females above 15, children and youth; and for the total amount paid in wages during the year.

In the ninth census, as in the eighth and seventh, the reports of the enumerators brought in results that were

¹ In the census of 1850 the tables of manufactures have been found "arithmetically imperfect," but it is not known whether the errors are in the items, or the totals, or in both. See Ninth Census, 3 : 393, note.

² Report on a Permanent Census Bureau, 149, 153.

³ Eighth Census, Mortality and Miscellaneous Statistics, 512.

⁴ Report of Committee on Census, 1870, p. 55. House Report, 3, 41st Congress, 2d Session.

⁵ Report on Permanent Census Bureau, 167; Ninth Census, 1 : xxxi.

obviously defective. General Walker caused special investigation to be made by the Census Office, with the result that thousands of establishments omitted by the marshals were included in the report upon manufactures.¹ The final tables were admittedly defective, although much more complete than those of any previous census. This is apparent from the enormous increase in the total number of establishments reported.² We must now consider the manner in which the statistics of wages were affected by the inclusion of this large number of establishments not previously enumerated. This is a matter of importance because the statistics collected by one census have been compared with those presented in the others. From such data, average rates of yearly earnings have been deduced, and misleading results have been reached.³

With the frankness characteristic of its superintendent, the Ninth Census states explicitly that the enumeration of industrial establishments had been much more thorough than ever before, although it was still far from complete. It was shown that in 1860 the census had

¹ Ninth Census, 3 : 374.

² This number at each census was :

| | |
|-----------|---------|
| 1850..... | 123,025 |
| 1860..... | 140,433 |
| 1870..... | 252,148 |
| 1880..... | 253,852 |
| 1890..... | 355,415 |

Eleventh Census, Manufacturing Industries, 1 : 67.

³ The census volumes usually have compared total wages paid and the aggregate number of hands employed from decade to decade. Prior to the eleventh census, the writer can find no actual computation of the average rate of wages of the entire country. See Eleventh Census, Manufacturing Industries, 1 : 19. But many writers have computed average rates of wages from these census figures, and such computations have been widely quoted as official statistics. See Carroll D. Wright, in *Atlantic Monthly*, 80 : 305, Industrial Evolution of the United States, 191 ; Mulhall, in *North American Review*, 160 : 647 ; Jeans, in *Fortnightly Review*, 58 : 752.

returned, in its tables of occupations, 450,634 artisans employed as painters, carpenters, blacksmiths, and coopers.¹ Of these, only 39,389, or nine per cent, were accounted for in the statistics of manufacturing and mechanical pursuits. Now the total number of employees enrolled in the tables of all manufactures was 1,311,246. The omission of 411,000 skilled artisans in these four trades removed from the statistics of wages a number of high-priced laborers that amounted to 31 per cent of all the persons enumerated. The census returns showed an average wage of \$289 for all persons employed: while carpenters received \$429; painters, \$415; blacksmiths, \$307; and coopers, \$311. It is evident, therefore, that the average wages computed from the eighth census are smaller than they would have been if these classes of skilled laborers had been more fully enumerated. Now in the ninth census General Walker took pains to secure more complete returns of persons employed in manufacturing and mechanical industries. As a result, 155,000 artisans were enumerated in these trades, as given in the statistics of manufactures. This was over 25 per cent of the whole number of such workmen included in the statistics of occupations. This fact, alone, must have tended to increase the average wage that has been deduced from the wage statistics of the ninth census, and to render difficult a comparison with the rates of the earlier censuses.

Great changes were introduced into the methods adopted by the tenth census in collecting the statistics of manufactures. The superintendent was authorized to withdraw the collection of such data from the regular enumerators, and to employ special agents where he considered such a method advisable. Accordingly, in

¹ Ninth Census, 3 : 373.

279 principal cities and towns, the statistics of manufactures were gathered by special agents.¹ As a result, manufacturing establishments in these largest industrial centers were more fully enumerated than ever before.

From the copies of the schedules that have been published² it would appear that the tenth census asked for the "total amount paid in wages during the year" and the "average number of hands employed," males above 16, females above 15, children and youths. These questions were the same as those used in the preceding census. In addition, the tenth census called for the "greatest number of hands employed at any one time during the year," and asked for estimates concerning the "average day's wages" for a skilled mechanic and for an ordinary laborer. Such answers as were received to these last questions seem not to have been published.

It is evident that the superintendent of the tenth census thought that the statistics gathered concerning the number of hands employed represented the average number for the census year.³ But this was clearly a mistake. An examination of the original schedules of the tenth census has shown that the figures of the average number of hands employed, for nearly one-half of the establishments, were the same as the greatest number of hands employed at any one time during the year. In the remaining establishments the statistics of the average number of hands represented the number employed during the weeks of the busiest season. As a result, the tenth census failed to get the average number of persons employed in manufactures; and, instead,

¹ Tenth Census, 2 : viii.

² Report on Permanent Census Bureau, 167.

³ Tenth Census, 2 : xxviii.

secured a number "almost always more than the average and often several times the average."¹ This is conceded in the eleventh census, which states:² "The questions used in 1880 tended to obtain a number of employees that would be in excess of the true average, while it is believed that the questions used in 1890 have obtained, as nearly as possible, the average number."

A comparison of the tenth census with the Massachusetts census of 1885 will make it evident that the tenth census secured a number of employees far in excess of the average number. The Massachusetts census ascertained the total hands employed during the year, and the total wages paid to the 419,966 employees thus enumerated. From these figures an average wage of \$351.02 was computed.³ The census of 1880 enumerated 352,255 employees in the State of Massachusetts; and from its statistics, the averages wages for the state appear to be \$364.⁴ These results correspond fairly well, when it is remembered that the Federal census secured in some cases a number of employees less than the total number employed during the year, and therefore used a smaller divisor than was employed by the Massachusetts census. Now, in 1886, the Massachusetts bureau began the publication of its annual reports upon manufactures. In these the bureau ascertained the average number of hands employed, and used this number as a divisor in computing average wages for the state. As a result, an average wage of \$395.89 was computed in 1886,⁵ or

¹ Letter of Frederic C. Waite, who made the examination. Published in *American Journal of Sociology*, 3 : 360-361. See also the quotation from Carroll D. Wright, upon same page.

² Eleventh Census, Manufacturing Industries, 1 : 14.

³ Massachusetts Census, 1885, 2 : xci.

⁴ Tenth Census, 2 : 15 (folio page).

⁵ Statistics of Manufactures, 1886, 51.

\$44.87 more than the average wages in 1885 as shown by the state census. This difference in due, of course, to the employment in 1886 of a smaller divisor than was used in 1885. The state census of 1885 took pains to ascertain not only the total number of hands employed during the year, but also the number employed upon June 30, 1885.¹ If we assume that the number employed upon June 30 approximated the average for the year, and use it for a divisor, we can deduce an average wage of \$389 from the census of 1885. This differs from the average wage computed for 1886, in the statistics of manufactures, by only six or seven dollars. A study of these figures will make it apparent that the Federal census of 1880, like the state census of 1885, really secured for Massachusetts a number of operatives far in excess of the average number, and differing but slightly from the total number employed during the census year.

One other matter should be mentioned at this point. The tenth Federal census did not ask for the number of "officers and clerks" except in a few of the textile industries.² Its figures represent, therefore, the number of laborers and the wages received by them in nearly all cases, except those in which the persons who filled out

¹ Massachusetts Census, 1885, 2 : xci. The total number employed during the year was 419,966 ; while the number employed on June 30 was 379,328.

² In some of the textile industries the schedules called for information concerning the number of "officers and clerks." See Eleventh Census, Manufacturing Industries, 1 : 13 ; *Journal of Political Economy*, 4 : 89. In the cotton industry the number of such persons as "officers and clerks" is given as 2,115 ; but their wages are not included in the total wages, and they are excluded from the total number employed. Tenth Census, 2 : 955 (folio page). In the woollen industry, on the other hand, 1,302 officers and clerks are included in the table of total employees, and probably their wages are also included. Tenth Census, 2 : 967 (folio page).

the schedules reported the number of officers and clerks with the other employees. When this was done, Mr. Waite found that the officers and clerks "were not credited with any wages except in exceedingly few cases" ¹

In addition to the data contained in the statistics of manufactures, the tenth census devoted a special volume to the subject of wages.² This was prepared under the careful direction of Mr. Joseph D. Weeks. It related to wages in fifty-three of the more important manufacturing industries, and also presented much valuable information concerning methods of remuneration, regularity of employment, and similar subjects. Some of the materials were drawn from as early a period as the decade from 1830 to 1840, and possess considerable historical interest.

Mr. Weeks attempted to select, in each industry, typical establishments of recognized credit and standing, and to make the returns as accurate as possible. The various classes of employees were carefully distinguished, and only those classes were finally selected whose work had not materially changed in character during the period covered by the report. Thus it is probable that the data collected are thoroughly comparable. The schedules called for "rates of wages or average earnings" for each class of employees, by the day, week, month, or year, or by the piece. It was found that the "rates of wages at the several works of the same class in a given district do not vary much for a given class of labor"; and Mr. Weeks expressed the belief that the

¹ *American Journal of Sociology*, 3 : 360. This point is discussed, but not clearly, in the Eleventh Census, Report on Manufacturing Industries, 1 : 13-14. See also *American Journal of Sociology*, 3 : 626.

² Tenth Census, 20. Report on the Statistics of Wages in Manufacturing Industries.

report would "furnish the means for obtaining a fair average for the whole country".

With all the care that was taken in selecting establishments for investigation, the first sets of returns were often unsatisfactory. In these cases Mr. Weeks called attention to defects, and asked for corrected data. The chief difficulty seemed to be in securing a uniform classification of employees in establishments of the same class, and uniform units of payment. Sometimes schedules were "passed backward and forward several times before a final adjustment was reached."

Mr. Weeks confined his attention to the collection of trustworthy and comparable materials, and did not attempt to compute average rates of wages for all establishments. Thus the report presents materials rather than final results. It collects as many facts as possible concerning wages in important establishments, and leaves to the reader the work of comparison and combination. The report undoubtedly deserves high praise. If any criticism can be passed upon the materials here presented, it grows out of a circumstance that was beyond the control of Mr. Weeks. The average wages of each class of laborers in each establishment were generally computed in the counting rooms; and under these conditions there must have been some danger that the book-keepers would select an arithmetical mean instead of computing a true average.

The eleventh census devoted no special report to the subject of wage statistics. The establishment of the United States Department of Labor in 1885 rendered such an investigation less necessary for the Federal census. The statistics of manufactures, however, contained the customary inquiries concerning employees and wages.

In 1890 the investigation into manufacturing industries was much more complete in towns and cities than it had ever been in earlier censuses. The superintendent was able to place 1,042 cities in the hands of special agents, as against 279 cities so treated in the tenth census. In country districts, on the other hand, the canvass was far less thorough;¹ and there is reason for thinking that in these cases the eleventh census was more defective than the tenth. The official who was in charge of this branch of investigation has written:² "I am confident that in the rural districts, as a whole, the canvass of 1880 resulted in securing a larger number of reports than did that of 1890." These facts have an important bearing upon the comparability of the wage statistics of the two censuses.

The schedules used in 1890³ called for a more minute classification of laborers than had been attempted before that time. As published, the tables distinguish three

¹ On this point the census says: "Under these circumstances, the canvass of the cities was more thorough than that of the rural districts, and the apparent decrease in some industries and some states is due, in part at least, to the less efficient canvass by the general enumerators. The defective canvass of the enumerators is more apparent in the totals for states in which there are comparatively few large cities, such as Nevada, or for industries conducted largely by establishments located in the rural districts, of which 'Leather, tanned and curried' is an example." Eleventh Census, Manufacturing Industries, 1:1. Mr. Robert P. Porter says concerning the returns of manufactures furnished by the regular enumerators who operated in country districts: "Except in a few isolated cases the returns of productive industry secured by these enumerators have proved utterly valueless, and hence the Census Office, in order to obtain accurate data, has been subjected to heavy outlay in securing correction and reproduction of the returns." Report on a Permanent Census Bureau, 18,f.

² *American Journal of Sociology*, 3:624. See also letter by Carroll D. Wright, quoted in *Journal of Political Economy*, 4:89.

³ Eleventh Census, Manufacturing Industries, 1:13; Report on a Permanent Census Bureau, 178,f.

classes of workers, (1) officers, firm members, and clerks; (2) operatives, skilled and unskilled; (3) pieceworkers. Each of these classes is subdivided into, (1) males above 16, (2) females above 15, and (3) children.¹ The schedules called for the average number employed throughout the year, and the total wages paid to each class of workers. The tenth census had called for the average number of hands, but had failed to secure such data. The eleventh census carefully defined what should be considered the average number; and probably succeeded, in large measure, in obtaining it.² This fact, also, is important in any comparison of the tenth and eleventh censuses upon these points.

The schedules called, also, for weekly rates of wages and the average number of hands employed at each rate, as well as for information concerning the number of months that the establishments were in operation.³ These questions were more important than any of the others for the student of wage statistics, and were in line with the best results of recent investigations. But to secure such data for the whole United States was a work of great difficulty, and one that went far beyond anything that had been attempted in previous censuses. The plan seems to have been carried out successfully in many of the more important industries. In the third volume of the report, classified wage tables are given for such industries as woollens, cottons, silks, glass, petroleum, iron and steel, etc.⁴ Such statistics possess

¹ Eleventh Census, Manufacturing Industries, 1 : 19. In Table 8 of Vol. I, there is given a still more minute classification of employees in selected industries. Clerks are separated from firm members and officers, while operatives are divided into skilled and unskilled.

² Eleventh Census, Manufacturing Industries, 1 : 14.

³ *Idem*, 1 : 13.

⁴ *Idem*, 3 : 146, 150, 208, 230, 302, 338, 346, 356, 361, 372, 390, 397.

great value for the student of wages.¹ For him the importance of the report lies mainly in these classified wage tables. The use which the census made of the statistics concerning yearly earnings and the average number of employees is open to criticism in one respect.

The eleventh census used its data concerning hands employed and wages paid, for the purpose of computing average yearly earnings. When this is done for all classes of laborers in the United States, the average thus obtained falls so far short of being typical that it possesses little value for scientific purposes. For this reason, perhaps, the eleventh census computed also the average earnings for each class of employees; and, within each class, gave separate data for men, women, and children.² Such tables are open to far less objection. The census then compared the data concerning average earnings in four different ways. First it presented tables that contrasted the wages paid to employees, men, women, and children, in fifteen industries that employed a large proportion of females, and wages paid in fifteen industries that employed a small proportion. Then it gave the average annual earnings of each class of employees in the various states and territories. Next it gave similar data for each class of workers by specified industries, and finally it presented in a single table the statistics for six of the largest industries. Such a treatment of the materials tended to secure more homogeneous classes of operatives, so that the wages computed are far less unreal averages, and must be more typical of the average condition of the laborers in each class. Moreover, since in these selected branches of

¹ In Table 8 of the first volume on manufactures, the census gives the average weekly earnings of each class of employees in selected industries, as well as the total yearly wages.

² *Idem*, I : 20-28.

business the statistics were, for the most part, gathered at centers of industry, and by competent agents, we may fairly assign considerable value to the investigation.

In the report upon manufactures, however, there is one feature that calls for criticism. The average annual earnings per employee, exclusive of officials and clerks, are contrasted with the average annual earnings that may be computed from the tenth census. Thus we are told that the average annual wages in 1880 were \$346.91, while in 1890 they were \$444.83.¹ The report is careful to add that: "Owing to differences in the form and scope of the inquiry of 1890, as compared with that of 1880, previously referred to, neither of these average annual earnings for 1890 should be accepted as the exact increase during the decade." Some of these "differences in the form and scope of the inquiry" had been explained on a previous page,² where it was declared that "a comparison of the average annual earnings for all classes of employees as obtained from the reports of the two censuses" was "impracticable." But others were not sufficiently explained, so that it seems necessary to consider the matter at some length. If the census officials deemed the two sets of figures entirely

¹ *Idem*, 1 : 19. Including officers and clerks, the average for 1890 was \$484.49. But, as such persons were not included in 1880, they were excluded from this comparison. It is interesting to notice that Mr. Mulhall blundered into the very error against which the census had given warning. He takes \$484.49 as the average wages for 1890 ; and compares this figure with \$346.91, the average wages for 1880. See *North American Review*, 160 : 647.

² Eleventh Census, Manufacturing Industries, 1 : 14. In his report upon the textile industries, Mr. S. N. D. North makes a somewhat similar explanation : "The increase in wages and average annual earnings for each employee, as in other items, may be due in part to the change in the form of inquiry and the more perfect enumeration at the census of 1890. The large decrease in the number of children employed also has considerable bearing on the increase in the average annual earnings." *Idem*, 3 : 10.

incomparable, it was unfortunate to make any comparison of averages. For, although it is certain that any person who attempts to use the census should examine all the explanations that accompany the figures, it is equally sure that the average popular writer or newspaper scientist will not do anything of the sort. And, as a matter of fact, eminent statisticians have compared the average wages for 1890 with the census figures for 1880, 1870, 1850, and 1850. Folio pages of census statistics that invite comparison seem to possess powers of attraction that no amount of caution and explanation can be expected to exercise.

The errors and omissions of the returns of manufactures in 1870 and previous census years are so notorious that it cannot be necessary to repeat what has already been said concerning the mistakes that must arise from the attempt to compare rates of yearly wages deduced from such materials. With the tenth and eleventh censuses, however, greater accuracy and completeness were secured, so that the incomparable character of their statistics of wages is not so easily seen. But the writer believes, nevertheless, that the attempt to compare the average wages computed for 1880 and 1890 can lead only to most erroneous and mischievous results.¹

The first reason for considering the wage statistics of 1880 wholly incomparable with those of 1890 is that the later census was far more complete in the cities and large towns, while the earlier census was probably more complete in the country districts. Upon this point the facts have already been stated. The necessary result is that the average wages computed from the

¹ Thus Mr. J. S. Jeans, using such data, came to the conclusion that wages had advanced more during the decade from 1880 to 1890 than they had in the thirty years prior to 1880. *Fortnightly Review*, 58:752.

eleventh census are based upon figures that include a far larger proportion of city laborers, who receive higher money wages; while the census of 1880 probably included a larger proportion of country laborers, whose money wages are lower.

The importance of this consideration can be shown most readily by studying the average wages for the various counties of Massachusetts, as given in the state census of 1885. The figures are as follows :¹

| | | |
|-------------------------------|---------|---------------|
| Plymouth county | ----- | \$396.97 |
| Suffolk | “ ----- | 369.13 |
| Essex | “ ----- | 365.61 |
| <i>State of Massachusetts</i> | ----- | <i>351.02</i> |
| Franklin county | ----- | 348.56 |
| Norfolk | “ ----- | 348.11 |
| Worcester | “ ----- | 342.85 |
| Hampden | “ ----- | 341.61 |
| Middlesex | “ ----- | 330.77 |
| Bristol | “ ----- | 324.16 |
| Berkshire | “ ----- | 305.68 |
| Hampshire | “ ----- | 283.38 |
| Nantucket | “ ----- | 277.98 |
| Barnstable | “ ----- | 238.97 |
| Dukes | “ ----- | 106.79 |

Plymouth county, which heads the list, is only in appearance an exception to the statement that the highest wages are found in the counties having the largest proportion of urban population. In that county there is one large city, Brockton, where the average wages were \$433. In the rest of the county the average was \$65 less than in the city of Brockton. The same thing is noticeable in Worcester county, where the city of Worcester is the only large center of population. In this city wages averaged \$382; while in the rest of the county they averaged only \$324. It is evident that if one census of the state should be made far more complete for the cities than any previous census, while its

¹ Massachusetts Census of 1885, 2 : ci.

enumeration of country laborers should be less complete, there would result an apparent increase of the average wages for the state in a period when wages might actually have remained stationary.

In the Federal census of 1890 a comparison of the average earnings in the fifty principal cities with the average for the entire country¹ shows that thirty-six out of the fifty cities were credited with wages that exceeded the average for the country. Of the fourteen cities where the average wages were less than the average for the United States, many showed figures that were far above the wages for the rest of the states in which they were situated. If we select the principal class of wage-earners, males above sixteen years, and exclude officers and clerks, the results are still more striking. The writer has made such a computation for the eight largest cities, with the following results: The United States, \$498; Baltimore, \$503; Philadelphia, \$568; St. Louis, \$569; Chicago, \$587; Brooklyn, \$636; Boston, \$654; New York, \$702; San Francisco, \$709. In Baltimore, where the wages show the smallest excess over the figures for the United States, it appeared that the average for the city was \$226 higher than the average wages for the same class of workers in the rest of the state.

The class of employees last mentioned, viz., males above sixteen years, is the more important in this connection because it was among just such laborers that the enumeration of the eleventh census was especially complete. The census explains² that: "The great increase shown in statistics for industries known as 'hand trades' is largely due to the fact that no previous census has obtained so complete a report regarding such industries

¹ Eleventh Census, Manufacturing Industries, 2 : xxxviii.

² *Idem*, 1 : 2.

as masonry, carpentering, blacksmithing, cooperage, painting, plumbing, and similar trades using machinery to a limited extent." In four classes of laborers, viz., masons, painters and paperhangers, plumbers, and carpenters, the eleventh census enumerated 357,000 persons, against 97,000 enumerated in 1880.¹ This was an increase of 260,000 laborers, or 266 per cent, during a decade when the whole population of the country increased less than 25 per cent. Now these particular trades receive wages that are far above the average for the United States. Excluding officers and clerks, the average wage of the country is given as \$444.83. In these four trades very few women and children are employed; and the males above sixteen years, who form nearly the entire number of workers enumerated, are credited with the following wages: plumbers, \$627; masons, \$628; painters and paperhangers, \$644; carpenters, \$648.² We find, therefore, that the eleventh census enumerated more than 200,000³ workmen who were omitted from these trades in 1880. These 200,000 or more workers formed 5 or 6 per cent of all persons engaged in manufacturing occupations in 1890, excluding officers and clerks. Their wages exceeded the average wages of all classes of laborers by amounts that varied from \$182, in the case of plumbers, to \$203, in the case of carpenters. This one body of employees, excluded in 1880 and included in 1890, would tend to increase the average wages for all persons engaged in manufactures by ten to twelve dollars, if not more.⁴

¹ *Idem*, I : 74, 79, 80, 81.

² *Idem*, I : 23-27.

³ This figure allows for more than fifty per cent increase in these particular trades. The employees in all manufactures increased fifty per cent from 1880 to 1890, excluding officers and clerks.

⁴ Since the writer made this estimate, the official who had charge of these statistics in the eleventh census has stated that, if the trades

But there is a second reason, of still greater weight, for holding the results of the two censuses to be incomparable. There is no room for doubting that in 1890 the total wages paid were divided by a number of employees that was much smaller than it would have been if the same methods had been followed that were used in 1880. Upon this subject the census says:¹ "The questions used in 1880 tended to obtain a number of employees that would be in excess of the true average, while it is believed the questions used in 1890 have obtained, as nearly as possible, the average number." Attention has already been called to this fact. It is the more important since it had the same result as the first cause of difference between the figures of the two censuses. It tended to produce a larger average wage in 1890.

We have seen that the Massachusetts census of 1885, using as a divisor the *total* number of hands employed during the year, computed an average wage of \$351.02 for the year 1885. It has also been shown that in 1886, when the publication of the annual reports on manufactures was begun, the *average* number of employees was taken as a divisor, and the average wages were thereby increased to \$395.89. Precisely the same thing occurred in the Federal statistics when the eleventh census actually ascertained the average number of employees, and used this as a divisor. Further light is thrown upon this question by the Massachusetts census for 1895, which has appeared during the past year. This census ascertained the total wages paid to all employees in manufacturing industries, and divided this

that were imperfectly enumerated in 1880 should be excluded from the tables for 1890, the average wages for the United States would be \$429 instead of \$444. See *American Journal of Sociology*, 3 : 627.

¹ Eleventh Census, Manufacturing Industries, 1 : 14.

sum by the *average* number of hands employed. Thus an average wage of \$446.41 was computed.¹ This shows a magnificent increase over the average rate of \$351.02 computed in 1885; but the larger wage was secured by using a smaller divisor, and the later census makes no attempt to compare the two results. No one would claim that the wages of laborers employed in manufacturing industries in the state had increased from \$351 to \$446 between 1885 and 1895. In the very year in which the last state census appeared, the bureau of labor statistics published the results of an investigation into comparative rates of wages paid in 1881 and 1897.² This covered twenty three industries, and showed an increased average wage in fifteen cases and a decreased wage in the eight other instances. These results may justify the claim that wages in Massachusetts showed on the whole a tendency to increase during the period in question; but they demonstrate also the atrocity of the error that would be committed by any one who should compare the censuses of 1885 and 1895, and should then claim that wages had increased on the average by \$95 during the decade.

There has been considerable discussion of the question whether the average number of employees, or the total number of persons employed during the year, should be selected as the divisor in determining yearly earnings. It is clear that if the total number is taken, the divisor will be swelled unduly by the transient laborers who drift from one establishment to another, and are sure to be enumerated more than once. Such a divisor would give average yearly earnings that would be too low. On

¹ Census of Massachusetts, 1895, 5 : 240, 280.

² Twenty-Eighth Annual Report of the Bureau of Statistics of Labor, 1-42.

the other hand, when we select the average number employed, we use as a divisor the average number of positions filled throughout the year. This gives average yearly earnings that represent what the individual laborers would receive if employment were continuous throughout the year. Average wages computed in this manner are more than the actual income of individual laborers, especially in trades where employment is irregular. It does not fall within the scope of this article to consider whether the census ought to inquire for the average number of employees, or for the total number. The statistics of manufactures are not designed primarily to furnish statistics of annual average wages. This particular question should be framed in such a manner as will be most useful for the primary purposes for which the investigation into manufactures is conducted. But we must insist that wage statistics computed with one kind of divisor must not be compared with data secured by the use of a different divisor.

Some of the criticisms that have been directed against the wage statistics of the eleventh census can be accounted for by remembering that the rates of annual wages given there represent, not the actual earnings of all persons employed, but the amounts paid annually to the occupants of a certain number of positions. Thus the average wages of carpenters in New York city are computed at \$896. This would mean \$3 per day for nearly 300 days of employment. A critic who has exceptional facilities for securing information concerning actual conditions in that city, writes: "The average wages of good, steady, thoroughly competent carpenters never exceeded \$650 for the entire year."

Some of the results of comparing the average wages given in the two censuses are so ridiculous as to show

the absolute incomparability of the two sets of data. Thus the same critic points out that, according to the census data, carpenters' wages in New York City increased from \$640 in 1880 to \$896 in 1890. For the city of Poughkeepsie we are asked to believe that carpenters' wages advanced from \$357 in 1880 to \$729 in 1890. These results are so absurd as to show that we are dealing with data that are either totally erroneous or else collected by such different methods as to be wholly incapable of bearing comparison.

It remains to be considered what the twelfth census should attempt to accomplish in this field of wage statistics. The writer will assume that the purpose of such statistics should be to investigate the conditions under which the large masses of our population who are dependent upon the receipt of wages are actually living. In the present condition of statistical science we can not hope that such investigation will throw much light upon what is technically called the problem of share distribution. Moreover, since the census can not well undertake to collect comprehensive statistics concerning the prices of commodities, it must confine itself to the question of money wages.

At the outset the question may fairly arise whether, in view of the establishment of the Department of Labor at Washington, the Federal census should continue to gather statistics of wages. This bureau was created for the purpose of investigating labor problems. It has already published much information relating to wages; and is, at the present time, preparing a report upon wages paid in the leading countries of the world.¹

If a permanent census bureau should be established and

¹ Am. Stat. Ass'n *Publications*, 5 : 373; Eleventh Annual Report of the Commissioner of Labor, 5.

should undertake the systematic collection of wage statistics, it would appear to be duplicating the work of the Department of Labor. If, on the other hand, the Census Office should remain a temporary affair, we may fairly doubt whether this particular field of investigation could not be covered more satisfactorily by the Department of Labor with its permanent organization. There is reason for thinking that even the special agents appointed by the census to collect statistics of manufactures do not always have the time or training for the work of gathering accurate data concerning wages. It seems probable that better results could be secured by placing additional funds at the disposal of the permanent labor bureau. Such an investigation might not cover as much ground as the census, but the improved quality of the materials might well counterbalance the greater quantity of the census returns. This would be especially true of that portion of the census statistics that may have to be left in the hands of the ordinary enumerator.

One other point is worthy of consideration. The census returns necessarily cover but single years at intervals of a decade. The periods when the census materials are gathered may happen to be abnormal, so that by this fact alone any comparison of results from one decade to another may be vitiated. Then, too, important fluctuations may take place within each decade, and upon these the census can give no information. Such considerations induced Massachusetts to provide for annual statistics of manufactures. Finally, the publication of census returns seems to be necessarily such a slow process that no inconsiderable advantage might result from the prompter methods of the Department of Labor.

Assuming, however, that the census, in its inves-

tigations concerning manufactures, is to continue to gather data concerning wages, we may consider what should be attempted. In doing this, we should remember that the principal purpose of the census investigations is to gather information concerning manufactures. The questions relating to total wages and employees should, therefore, be framed with this primary object in view.

For this last reason, the census should continue to investigate the total wages paid, as an important element in the expenses of manufacturing industry. But it may be doubted whether the data thus gathered should be used for the purpose of computing average yearly earnings of laborers. In any event, the utterly incomparable character of the statistics of the eleventh and preceding censuses should be set forth so clearly as to offer no possible excuse for the further misuse of their figures.

If the computation of the average yearly earnings is continued, the twelfth census should carry on the work, commenced by the eleventh, of ascertaining the average earnings of workers in each occupation, separating in all cases men, women, and children. Such data could be used for some purposes, since the averages thus computed would be based upon units of some degree of homogeneity. The results would be further improved if they could be more fully classified by sections of the country. Furthermore, a separate table might be prepared, from which the notoriously incorrect materials gathered by the ordinary enumerators outside of the cities and towns could be excluded. This was accomplished in the eleventh census in the separate volume devoted to the principal industrial centers. For all these purposes it would matter less whether the divisor

should be the *average* number of employees or the *total* number, provided that future censuses should adopt a uniform method of procedure.

It has been suggested that wage statistics should investigate only the earnings of laborers steadily employed in each establishment, because other workers are largely migratory or incapable.¹ It is urged that we should endeavor to ascertain primarily the earnings of capable laborers who are steadily employed during the months that each establishment is in operation. The importance of studying the numbers and condition of transient employees is not denied, but it is considered best to make this the object of an independent investigation. This point seems to be well taken, provided that it is feasible to separate the two classes of laborers. But it may be impossible to introduce such a feature into the investigation concerning manufactures, and an independent inquiry might be needed in order to accomplish such a result.

The writer has already expressed the belief that the most valuable wage statistics contained in the eleventh census are to be found in the tables of classified weekly rates. The advantage of such a method is that it deals largely with actual facts, and does not employ averages that may be unreal and misleading. Such statistics, when properly tabulated, enable the student to ascertain exactly what rates of remuneration the great mass of the laborers is receiving.

Besides tabulating such returns so as to show, for each class of laborers, the numbers employed at each rate, and the per cent which such numbers bear to the total number of persons in each group, the results might

¹ See Mayo-Smith, in *Quarterly Journal of Economics*, 2 : 397, f. ; Von Meyr, in *Allgemeines statistisches Archiv*, 2 : 135.

be presented graphically according to the method suggested by Dr. Venn.¹ This consists in drawing a base line that shall represent the different rates of wages, and then constructing ordinates denoting the relative numbers of laborers receiving such specified rate. This plan would make it possible to plot a curve that would represent accurately the condition of the wage earners at a given time. Between different periods, changes in the shape of the curve would indicate the course of weekly rates of wages.

Tables of weekly wages need to be supplemented by statistics showing the number of weeks of full working time the operatives are able to secure in the course of the year. Such inquiries fall easily within the scope of the census of manufactures. With their use, the tables of weekly rates would furnish most valuable information concerning the course of wages in manufacturing industries.

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¹*Journal of Royal Statistical Society*, 64 : 445.